

FRANK, Otto

Prolapse of the rectum in children. Cesk.pediat.16 no.3:238-241
Mr '61.

1. Klinika pediatricke chirurgie pediatricke fakulty KU v Praze,
prednosta doc. MUDr. V. Kafka.
(RECTUM dis)

FRANK, O.

Aganglionic dysfunction of the intestines in newborns and infants. Rozhl. chir. 43 no.11.721-725 N '61.

1. Klinika pro detskou chirurgii fakulty detskoho lekarstvi Karlovy University v Praze, (prednosta prof. dr. V. Kafka, DrSc.).

FRANK, Otto, dr.

Disability evaluation in paralysis of the extremities. Liječn.
vjesn. 86 no.2:187-199 F'64

1. Iz Drugostepene invalidske komisije Republickog zavoda za
socijalno osiguranje u Zagrebu.

S

FRANK, Otto, dr.

Role of the general practitioner in disability insurance. Lijecn.
vjesn. 86 no.5:571-580 My '64

1. Iz Drugostepene invalidske komisije Republickog zavoda za
socijalno osiguranje u Zagrebu.

Frank, S.

The common bullhead (*Ameiurus nebulosus* les. 1819) in waters of our country. P. 35
Prague. Narodni Museum. CASOPIS; ODDIL PRIRODOVEDNY. Praha.
Vol. 125, no. 1, 1956

Source: EEAL - LC Vol. 5. No. 10 Oct. 1956

FRANK, St.

Nannobrycon eques (Steindachner). Wszechswiat no.5:123-124.
My'61.

FRANK, S.

Trichogaster trichopterus var. *sumatranus* Ladiges 1933. Wszechwiat
no.9:239 S '62.

FRANK, S.

Jordanella floridae (Goode and Bean 1879). Wszechswiat no.7/8:
204 J1-Ag '62.

FRANK, S.

Pterophyllum eimekei Ahl 1928. Wszechswiat no.7/8:204 J1-Ag
'62.

FRANK, S.

~~Gymnocorymbus~~ ternetzi (Boulenger 1895). Wszechswiat no.6:
163 Ja '62.

FRANK, S.

Roeboides microlepis (Reinhardt 1849). Wszechswiat no.6:163-164 Je '62.

YARUSTOVSKIY, A.A.; SVETLOV, M.F.; LIKIN, V.V., redaktor; BALAKIREV, V.F.,
redaktor; FRANK, S.I., vedushchiy redaktor; BEGICHEVA, M.N.,
tekhnicheskii redaktor.

[Operation of mechanical and electrical sluice gate equipment]
Eksploataatsiia mekhanicheskogo i elektricheskogo oborudovaniia
shliuzov. Moskva, Izd-vo Ministerstva rechnogo flota SSSR, 1952.
210 p. [Microfilm] (MLFA 7:11)
(Sluice gates)

FRANK, T.

FRANK, T. 1st National Economic Conference of the Textile Industry. p. 28.

Vol. 11, No. 12, June 1956.

MUSZAKI ELET

TECHNOLOGY

Budapest, Hungary

So: East European Accession, Vol. 6, No. 2, Feb. 1957

FRANK, Tibor

Mechanization of the cleaning of textile factories as a
means of industrial organization. Magy textil 15 no.8:
388 Ag '63.

FRANK, Tibor

Relationship of industrial management with work psychology
and work physiology in the field of textile industry. Magy
textil 15 no.12:563-571 D '63.

FRANK, T

Frank T.

Frank T. Eng. "Pumps and Injectors Used in Steam Power Stations."
(Pompy i strumienice stosowane w elektrowniach cieplnych). Energetyka.
No. 1-2, 1950, pp. 13-21, 9 figs. 1 tab.

The influence of temperature on the operation of the pumps, cavitation and the origin of that phenomenon in hot water pumps. Descriptions of the arrangement of pumps in steam-power plants, drive and design of circulating water pumps, characteristics of the work and design of condensate-removal pumps. Reciprocating air pumps and their design, steam and water injectors. Arrangement of pumps, boiler feed water tanks and deaerators in general use. Selecting the size of feed water pumps on the basis of characteristics of their curves. Indications for designing feed water pump installations in boiler houses.

SO: Polish Technical Abstracts No. 2, 1951

Frank, T.

621.311.22

4870. Layout of the main building of a power station with 50 MW turbogenerators. Z. MROCKOWSKI, Alicja T. FRANK. *Przegląd elektrotech.*, 30, 176-82 (May 21, 1954) in Polish.

Relatively small floor area and size of the main building of steam power station are required by units comprising two 60 MVA 10 kV turbogenerators and 110 atm. 510°C 230 tons/hour boilers. Details of steam system, coal pulverizing plant, main electrical circuit and two alternative layouts of equipment and of the reinforced concrete buildings are given.

J. LUKASZEWICZ

FRANK, T.

Completion of the largest thermoelectric power plant in Denmark, p. 49. (ENERGETYKA, Stalinogrod, Vol. 9, no. 1, Jan./Feb. 1955.)

SO: Monthly List of East European Accessions, (EEAL), LC, Vol. 4, No. 1, Jan. 1955, Uncl.

FRANK, T.

The technical book as an aid to worker and engineer.

p. 161
Vol. 9, no, 3, May/June 1955
ENERGENTYKA
Stalinogrod

SO: Monthly List of East European Accessions (EEAL) LC, VOL. 5, no. 2
Feb. 1956

FRANK, T.

A discussion of Soviet electric power engineers on electric systems of hydroelectric power plants. p. 229.

ENERGETYKA, Vol. 9, No. 5 Sept./Oct. 1955

(Ministerstwo Energetyki) Stalinogrod.

SOURCE: EAST EUROPEAN ACCESSIONS LIST Vol. 5, No. 1

Jan. 1956

FRANK, T.

Increasing the coefficient of power of equipment used in electric-power plants.
p.39.

ENERGETIKA (Ministerstwo Energetyki) Stalinogrod
Vol. 10, no. 1, Jan./Feb. 1956

So. East European Accessions List

Vol. 5, No. 9

September 1956

FRANK, T.

FRANK, T. Selection of equipment for direct current installations in
electric-power plants. p.292 Vol. 32 no. 7 July 1956
Warszawa Poland:

SOURCE: East European Accessions List (EEAL) Vol. 6 No. 4 April 1957

FRANK, T.

FRANK, T. Organizational problems in light industry. p. 35.

Vol. 10, no. 6, June 1956

TOHBTERMELES

Budapest, Hungary

So: East European Accession, Vol. 6, No. 5, May 1957

FRANK, Tibor; SZASZ, Marton; MARK, Ferenc; BOSNYAK, Tamas; LUGOSI, Karoly;
FEKETE, Istvan; TOMPOS, Karoly; KABDEBO, Kornel; JAVOR, Bela; SCHEFTSIK,
Jeno; VOGL, Ferenc; REITER, Gyorgy

Conference on the current tasks of the light industry workers. Munka
szemle 5 no.3:5-7 Mr '61.

1. Textilipari Muszaki Tudomanyos Egyesulet Ipargazdasagi Szakosztalya
titkara (for Frank). 2. Kispesti Textilgyar munkaügyi osztaly vezetője
(for Mark). 3. Konnyuipari Miniszterium Munkaügyi es Oktatasi Osztalya
vezetoje (for Szasz). 4. Ujpesti Gyapjuszovogyar munkaügyi osztalya
vezetoje (for Bosnyak). 5. Kender Juta es Textil Ipar munkaügyi osztaly
vezetoje (for Lugosi). 6. Kobanyai Textilgyar munkaügyi osztalya vezetője
(for Fekete). 7. Konnyuipari Miniszterium Pamutipari Igazgatosaga mun-
kaügyi osztaly vezetője (for Tompos). 8. Magyar Pamutipar munkaügyi osz-
talya vezetője (for Kabdebo). 9. Majus 1 Ruhagyar munkaügyi osztalya
vezetoje (for Javor). 10. Konnyuipari Miniszterium Len-Kenderipari Igaz-
gatosaga munkaügyi osztalya vezetője (for Scheftsik). 11. Ruhaipari
Tervezo Vallalat (for Vogl). 12. Goldberger Textilmuvek munkaügyi foosz-
taly vezetője (for Reiter).

FRANK, Tibor

Is plant management an organic part of the activity of
Hungary's textile industry enterprises? A polemic article.
Magy textil 14 no.2:84-85 F '62.

FRANK, Tibor; KOTWICKI, T. [translator]

Present state and tasks for the future in the field of
organization of enterprises in the Hungarian textile
industry. Przegl włokien 16 no.7/8:431-433 J1-Ag '62.

FRANK, Tibor

Organization and procedure of the technical divisions of the technical industry enterprises. Magy textil 14 no.11:515-517 N '62.

1. Hazai Pamutszovogyar.

FRANK, Tibor

Improvement of the transportation work at the Hungarian Cotton Weaving Factory. Kozleked kozl 18 no.48:865-867 2 D '62.

FRANK, Tibor

Report on the Moscow conference on the textile industry economics.
Magy textil 15 no.4:188-189 Ap '63.

FRANK, Tibor

Training of textile industry engineers-economists in the
Soviet Union. Magy textil 15 no.5/6:264 My-Je '63.

FRANK, Tibor

_____ Aptitude tests carried out in the Hungarian Cotton Mill. Magy
textil 15 no.7:317-318 JI '63.

FRANK, Tibor

Organizational experience with the manager of the textile industry enterprises. Musz elet 18 no.9:6 25 Ap '63.

FRANK, Tibor

Possibilities for the development of industrial management
within the framework of the Federation of Technical and Scien-
tific Associations. Muzs elet 18 no.21:2 10 0 '63.

FRANK, Tibor

Problems relating to the selection and employment of textile industry workers. Munka szemle 8 no.4:7-9 Ap '64.

FRANK, Tibor

Formation of an up-to-date organization at industrial enterprises.
Munka szemle 8 no.11:20-23 N '64.

FRANK, Tibor

Conditions for the formation of an adequate "operational
atmosphere." Magy textil 16 no. 6:280-283 Je '64.

FRANK, Tibor.

Is there any manpower shortage in the light industry? Husz
elst 19 no.19:4 10 S '64

FRANK, Tibor

Is there any shortage of manpower in the light industry?
Musz elet 19 no.21:2 8 G '64.

FRANK, Tibor

Organizational tasks of management. Elem ipar 18 no.10:
321-328 0 '64.

FRANK, Tibor

New features of the work of the Federation of Technical
and Scientific Associations. Musz elet 20 no.1:2 14 Ja '65.

CISAR, Iudvik, inz.; FRANK, Vaclav, inz.

Causes and analysis of the collapse of some constructions.
Poz stavby 11 no.11: 603-606 '63.

1. Technicky a zkusebni ustav stavebni, Praha.

FRANK, W.

Structural balances in power economy. p. 570

ENERGIA ES ATOMTECHNIKA. (Energiagazdalkodasi Tudomanyos Egyesulet)
Budapest Hungary

Vol. 11, no. 9/10, Sept./Oct. 1958

Monthly list of East European Accessions (EEAI) LC., VOL. 8, no. 7, July 1959

Uncl.

YANOVSKIY, M.I.; GAZIYEV, G.A.; NIKIFOROV, V.P.; MAKARENKO, V.G.; ZIMIN,
R.A.; MARININ, P.I.; FRANK, Yu.A.

Gas chromatograph with automatic pickup of samples from a flow.
Zav. lab. 31 no. 12:1526-1528 *65 (MIRA 19:1)

1. Institut khimicheskoy fiziki AN SSSR.

The Construction of Electromagnetic Barriers of Rod-Shaped
Materials. *Z. Krasa*. (Sbornik Telekroskopie, 1958, 200-204).
(In Czech). The construction of barriers is discussed with
special reference to a equipment of recent (Soviet).

DOMAC--TESAR, B.; FRANK, Z.

Malformations formed by local application of hypothermia
in the second half of pregnancy in the white rats. Bul sc
Young 7 no.1/2:5-6 F-Ap '62.

1. Zavod za histologiju i embriologiju Medicinskog fakulteta,
Zagreb,

*

Internal Medicine

CZECHOSLOVAKIA

FRANK, Zdenek; STVERAL, Jiri; DVORAK, Josef; Institute of Aeronautical Medicine (Ustav Leteckeheho Zdravotnictvi), Prague.

"Radio Waves Another Scourge of Civilization."

Prague, Radar, Vol 1, No 3, Nov 66, pp 56 - 58

Abstract: Factors influencing the medium in which people are living are discussed. Radio waves are defined as waves with frequencies between 100 kilocycles and 3,000,000 kilocycles, that is waves 1 cm to 3,000 meters long. Although these waves do not affect the senses of the body, they do have an influence on it. Thermal and non-thermal effects of the radio waves on the human organism are described. Clinical aspects of these effects are evaluated. Some of these effects are described in detail. Protection against the influence of electromagnetic fields is discussed; some peculiar effects of these fields on human beings are described. Biological effects of radio waves are discussed. 1 Table, no references.

1/1

Problem of the development of automation technology in the chemical industry. Automatizace 7 no.12:318-319 D '64.

1. Institute of Chemical Industry, Automation, Satelice.

FRANK-KAMENETSKI, A. D.

Origin of chemical elements. Biol i khim 5 no. 2:1-12 '63.

L 17129-63 EWT(d)/EPF(n)-2/FCC(w)/BDS AFFTC/ASD/ESD-3/APGC/IJP(C)/SSD
 Pu-4
 ACCESSION NR: AP3004963 S/0208/63/003/004/0766/0769

AUTHOR: Frank-Kamenetskiy, A. D. (Moscow)

TITLE: Solution of a kinetic equation by the Monte Carlo method 16

SOURCE: Zhurnal vyshisl. matematiki i matematich. fiziki, v. 3, no. 4, 1963, 766-769

TOPIC TAGS: Monte Carlo, kinetic equation, approximate solution

ABSTRACT: Use of the Monte Carlo method allows the acceleration of computation on standard high-speed machines, obtaining the solution of a kinetic equation with essentially greater accuracy than by the use of other known methods. The author considers such a solution of a kinetic equation in an example of the problem of finding the distribution of the flow of mono-energetic neutrons in a multi-zone heterogeneous cylindrical nucleus with arbitrary distribution of isotropic sources. For finding the mean flows in the zones $\bar{\Phi}_k$, the random motions N of the neutrons are tracked from the moment of "birth" to capture. For each neutron, its mileage in the given zone λ_{kv} is registered. Obviously, for large values of N .

Card 1/2

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ACCESSION NR: AP3004963

$$\bar{\Phi}_k = \frac{c}{V_k N} \sum_{v=1}^N \lambda_{kv} \quad (1)$$

where c is an arbitrary constant. The initial coordinates of the neutrons are chosen in a random fashion with respect to the given distribution of the sources. "I express my deep gratitude to I. M. Sobol' for his valuable comments." Orig. art. has: 6 formulas, 1 graph, and 1 table.

ASSOCIATION: none

SUBMITTED: 27Aug62

DATE ACQ: 30Aug63

ENCL: 00

SUB CODE: MM

NO REF SOV: 003

OTHER: 001

Card 2/2

VALENTA, Oldrich, inz. dr. CSc.; WEINER, Evzen, inz. dr. CSc. [deceased]

Effect of long-lasting vibration on the strength and bond of concrete.
Stav cas 12 no.2:85-101 '64.

ACCESSION NR: AP4015558

S/0089/64/016/002/0119/0122

AUTHOR: Frank-Kamenetskiy, A. D.

TITLE: Application of the Monte-Carlo method to the multigroup reactor computation

SOURCE: Atomnaya energiya, v. 16, no. 2, 1964, 119-122

TOPIC TAGS: Monte-Carlo method, multi group reactor computation, fission cross-section neutron capture, neutron scattering

ABSTRACT: The author discusses the application of the Monte-Carlo method for determination of the multiplication coefficient and the energy and space distribution of neutron fluxes in the multi-group transport approximation. The neutron scattering is assumed to be isotropic in the laboratory system. The probabilities of transitions between groups depend on both the elastic and inelastic neutron scattering. The computation of trajectories and fluxes in the group is similar to that given in the author's previous work (Zh. vy*chisl. matem. i matem. fiziki v. 3, 766 (1963)), as applied to two-

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ACCESSION NR: AP4015558

dimensional cylindrical geometry. Several generations of neutrons (original, secondary, etc.) are considered in succession. The method is justified when the ratio of the size of the active zone and the average migration path is close to unity. Thus, the Monte-Carlo method supplements the other computational method; its error is minimal when that of the diffusion approximation is maximal. Orig. art. has: 2 figures and 1 table.

ASSOCIATION: none

SUBMITTED: 17Jul63

DATE ACQ: 12Mar64

ENCL: 00

SUB CODE: NS

NO REF SOV: 006

OTHER: 005

Card 2/2

SOV/124-58 1-1263

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 1, p 156 (USSR)

AUTHOR: Frank-Kamenetskiy, G. Kh.

TITLE: Strain Calculation for Ring-shaped Parts (Raschet deformatsiy kol'tsevykh detaley)

PERIODICAL: V sb.: Gidroturbostroyeniye. Nr 4. Moscow-Leningrad, Mashgiz, 1957, pp 195-210

ABSTRACT: Bibliographic entry

Card 1/1

FRANK-KAMENETSKIY, L. Z.

"Partial Denervation of the Stomach in Ulcerous Diseases," Khirurgiya, No.5,
1948.

Surgical Clinic, 2nd Moscow Med. Inst. im. Stalin

USSR/Medicine/Neurology

FD-2939

Card 1/1 Pub. 17-3/23

Author : Frank- Kamenetskiy L. Z. (deceased) and Khodzhayev, Z. P.

Title : The vagus nerves as conductors of motor impulses to stomach and duodenum

Periodical : Byul. eksp. biol. i med., 7, 10-12, July 1955

Abstract : Following earlier experiments with resection of both vagus nerves below the diaphragm, author undertook chronic experiments on dogs cutting either the left (anterior) or the right (posterior) trunk. Both nerves were cut on the controls. The left resection produced changes typical of bilateral subdiaphragmatic vagotomy, the right resection affected only the stomach fundus. There was a comparatively quick restoration of motor functions of the stomach and duodenum after resection of either nerve trunk. 1 reference, 1 USSR, 1 since 1940, photographs.

Institution : Stalinabad Medical Institute

Submitted : 20 August 1954

BRINDLEY, G.W.; ZVYAGIN, B.B.[translator]; ~~FRANK-KAMENETSKAYA, T.A.,~~
[translator] redaktor; TSUKERMAN, A.M., redaktor; GRIBOVA, M.P.
tekhnicheskiiy redaktor.

[X-ray identification and crystal structures of clay minerals;
collection of articles. Translated from the English] Rentgenovskie
metody opredeleniia i kristallicheskoie stroenie mineralov glin;
sbornik statei. Perevod s angliiskogo B.B.Zviagina i T.A.Frank-
Kamenetskoi. Pod red. i s predisl. V.A.Frank-Kamenetskogo. Moskva,
izd-vo inostrannoi lit-ry, 1955. 402 p. (MLRA 8:11)
(Clay) (X-rays)

FRANK-KAMENETSKAYA, I.-A.-

GRIM, Ralph E.; ZVIYAGIN, B.B. [translator]; MIKHEYEVA, I.V. [translator];
MIKHEYEV, V.I. [translator]; RAZBEGAYEVA, G.I. [translator];
~~FRANK-KAMENETSKAYA~~, T.A. [translator]; FRANK-KAMENETSKIY, V.A.,
redaktor; YAKOVENKO, M.Ye., redaktor; DUMBRE, I.Ya., tekhnicheskii
redaktor

[Clay mineralogy. Translated from the English] Mineralogiia glin.
Perevod angliiskogo B.B.Zviagina i dr. Pod red. i s predisl. V.A.
Frank-Kamenetskogo. Moskva, Izd-vo inostrannoi lit-ry, 1956.
454 p. (MLRA 9:10)

(Clay)

"APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000413610002-4

1933-1957

APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000413610002-4"

FRANK-KAMENETSKIY, D. A.

"Recovering Sulfite Concentrates," USSR Patent 31, 132, September 30, 1933

Concentrating zinc vapors. D. A. Frank-Kamenetskiy.
Russ. 30,753, Feb. 28, 1934. Zn vapors are cooled by
passing through a tower filled with coke.

11. A.
Frank-Kamenetzki. *Soviet. Zolotozem.* 1915. No. 1-4. 41-42. Podlunskii Golets is the largest massive Au-bearing (white lady found in the Kommunar Au mine (formerly Bogomolovskaya)). Rpts. on the flotation and estn. of Au from this mine are described. S I M

A 53
J

761. Limiting Form of Free Convection for Large Grashof Numbers. D. A. Frank-Kamenetskiĭ. *Comptes Rendus (Doklady) de l'Acad. des Sciences, U.S.S.R.* 17. 1-2, pp. 9-12, 1937. In English.—For free convection the theory of similitude indicates that $Nu = \phi(Gr, Pr)$, where Nu , Gr and Pr are the Nusselt, Grashof and Prandtl numbers respectively. Experiments have shown that $Nu = K Gr^{1/3}$ for large values of Gr . According to the present author this is not a limiting law, and it is shown that at sufficiently high values of Gr a limiting law of the form $Nu = K Gr^{1/3} Pr$ is to be expected. For such a case it follows that the coefficient of heat transfer must increase proportionally to the square root of the determining dimension, to the $3/2$ power of the excess temperature and directly as the pressure. This result is considered to be of importance in the theory of post-explosion heat transfer, and the heat transfer in internal combustion engines, but experimental verification of this is difficult on account of the disturbing effects of radiation and forced convection.

R. W. P.

1ST AND 2ND ORDERS										3RD AND 4TH ORDERS										5TH AND 6TH ORDERS									
<p>Processes and Properties Index</p> <p>71</p> <p>Combustion of coal. D. A. Frank-Kamenetskii. <i>Uspe- shi Khim.</i> 7, 1277-1311(1938).—A review on the kinetics of coal combustion from the standpoint of the primary and secondary reactions, diffusion processes, and the chem- ical structure of graphite and coal. A comparison of theoretical with practical data shows that under practical conditions all factors must be considered simultaneously. P. H. Rathmann</p>																													
<p>ASAC-5LA METALLURGICAL LITERATURE CLASSIFICATION</p>																													

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1287. Propagation of Flame. J. B. Zeldowitch and D. A. Frank-Kamenetski. *Acta Physicochimica*, 9. 2. pp. 341-380, 1938. In English.—The older theories of the thermal propagation of flame by successive ignition of the gas mixture by the heat liberated in the reaction are unsatisfactory in that they use the conception of "ignition temperature" of the mixture. This ignition temperature is dependent on the properties of the mixture itself and the size and form of the containing vessel. A rational theory must therefore give the velocity of propagation as a function of the temperature and concentration of the reacting substances. Working with this object in view, formulae are deduced for the velocity of propagation in the case of first- and second-order reactions. They are somewhat complicated, but are in terms of thermal conductivity, heat of activation, density, calorific value, specific rate of reaction, the gas constant and temperature. The presence of parallel reactions and the formation of intermediate products greatly restrict the application of these simple formulae.

G. G.

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

1287	1288	1289	1290	1291	1292	1293	1294	1295	1296	1297	1298	1299	1300	1301	1302	1303	1304	1305	1306	1307	1308	1309	1310	1311	1312	1313	1314	1315	1316	1317	1318	1319	1320	1321	1322	1323	1324	1325	1326	1327	1328	1329	1330	1331	1332	1333	1334	1335	1336	1337	1338	1339	1340	1341	1342	1343	1344	1345	1346	1347	1348	1349	1350	1351	1352	1353	1354	1355	1356	1357	1358	1359	1360	1361	1362	1363	1364	1365	1366	1367	1368	1369	1370	1371	1372	1373	1374	1375	1376	1377	1378	1379	1380	1381	1382	1383	1384	1385	1386	1387	1388	1389	1390	1391	1392	1393	1394	1395	1396	1397	1398	1399	1400	1401	1402	1403	1404	1405	1406	1407	1408	1409	1410	1411	1412	1413	1414	1415	1416	1417	1418	1419	1420	1421	1422	1423	1424	1425	1426	1427	1428	1429	1430	1431	1432	1433	1434	1435	1436	1437	1438	1439	1440	1441	1442	1443	1444	1445	1446	1447	1448	1449	1450	1451	1452	1453	1454	1455	1456	1457	1458	1459	1460	1461	1462	1463	1464	1465	1466	1467	1468	1469	1470	1471	1472	1473	1474	1475	1476	1477	1478	1479	1480	1481	1482	1483	1484	1485	1486	1487	1488	1489	1490	1491	1492	1493	1494	1495	1496	1497	1498	1499	1500
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117 AND 118 CODES										119 AND 120 CODES									
PROCESSES AND PROPERTIES INDEX																			
BC										A-1									
<p>Theory of thermal propagation of flame. J. B. ZELDOVITSON and D. A. FRANK-KAMENETSKI (J. Phys. Chem. Russ., 1938, 12, 100-105).-- Consideration of diffusion and heat conduction in a flame lead to the expression $(T - T_0)/(T_1 - T_0) =$ $(a - a_0)/(a_1 - a_0) = (b - b_0)/(b_1 - b_0) \dots$, where $T,$ $a, b \dots$ are the temp. and concn. in a point of the flame, T_1 is theoretical temp. of combustion, $a_0, b_0 \dots$ $a_1, b_1 \dots$ concn. before and after the reaction, respectively, and T_0 the temp. before the reaction. J. J. B.</p>																			
<p>458-51A METALLURGICAL LITERATURE CLASSIFICATION</p>																			
117 AND 118 CODES										119 AND 120 CODES									
117 AND 118 CODES										119 AND 120 CODES									

SA

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3764. Non-Stationary Free Convection. D. A. Frank-Kamenetskii. *Comptes Rendus (Doklady) de l'Acad. des Sciences, U.S.S.R.* 18. 7. pp. 409-412, 1938. In English.—Dimensional analysis is applied to the thermal and hydrodynamical equations which represent free convection in the initial non-stationary stage. It is shown that the temperature distribution and the coefficient of heat transfer can be expressed as functions of two non-dimensional terms t/τ_1 and t/τ_2 . The values of τ_1 and τ_2 are d^2/κ and $(d/g\beta\theta_0)^{1/2}$ respectively, where d =length parameter, κ =thermal diffusivity, g =gravitation acceleration, β =coefficient of expansion and θ_0 =characteristic temperature difference. Since $(\tau_1/\tau_2)^2 = GrPr^2$, it follows that the functions can be so transcribed that only Gr and one of the arbitrarily chosen quantities τ_1 or τ_2 remains. The limiting case of $\tau_1 \gg \tau_2$ i.e., $Gr \gg 1$ has already been discussed by the author [see Abstract 761 (1938) and following Abstract.] R. W. P.

ASH-SLE METALLURGICAL LITERATURE CLASSIFICATION

1938 1939 1940 1941 1942 1943 1944 1945 1946 1947 1948 1949 1950 1951 1952 1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 2050 2051 2052 2053 2054 2055 2056 2057 2058 2059 2060 2061 2062 2063 2064 2065 2066 2067 2068 2069 2070 2071 2072 2073 2074 2075 2076 2077 2078 2079 2080 2081 2082 2083 2084 2085 2086 2087 2088 2089 2090 2091 2092 2093 2094 2095 2096 2097 2098 2099 2100 2101 2102 2103 2104 2105 2106 2107 2108 2109 2110 2111 2112 2113 2114 2115 2116 2117 2118 2119 2120 2121 2122 2123 2124 2125 2126 2127 2128 2129 2130 2131 2132 2133 2134 2135 2136 2137 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A 5.2

2765. Temperature Distribution in Reaction Vessel and Stationary Theory of Thermal Explosions. D. A. Frank-Kamenetskij. *Comptes Rendus (Doklady) de l'Acad. des Sciences, U.S.S.R.* 19. 7. pp. 413-414, 1936. In English.—By a further application of dimensional analysis to similar equations (see preceding Abstract) relations among non-dimensional parameters are established which enable the critical condition for inflammation to be determined in terms of one parameter δ . This parameter assumes a critical value for each vessel. For low gas pressures and small vessels $Gr \rightarrow 0$, and convection becomes negligible. Critical values of δ are calculated for this case for spherical, cylindrical and plane parallel vessels, and these are found to be in satisfactory agreement with experimental determinations.

R. W. P.

A 53
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SA

6598. Theory of Uniform Flame Propagation. J. B. Zeldovich and D. A. Frank-Kamenetskii]. *Comptes Rendus (Doklady) de l'Acad. des Sciences, U.S.S.R.* 10. 9. pp. 603-607, 1938. In English.—Of the existing theories of flame propagation, only that of Lewis and v. Elbe [see Abstract 4247 (1934)] takes into account the kinetics of the chemical process, and they assume that up to a given temperature of ignition no reaction occurs. Actually the reaction velocity is not an explicit function of time, but of the temperature and concentration of the reactants. The manner in which it depends on the time and on the distance from the flame front cannot be obtained before integrating the equation for propagation, and the resulting expression must, in particular, contain the required velocity of propagation. A general method of solving the complex differential equations involved is now suggested. H. H. Ho.

ASH-SLA METALLURGICAL LITERATURE CLASSIFICATION

ROOM 319-B212A

EXISTENCE

RECALL ONE ONLY LIST

1ST AND 2ND COPIES		3RD AND 4TH COPIES	
PROCESSING AND PREPARATION NOTES			
<p>Heat exchange from an infinite surface in an infinite space. D. A. Frank-Kamenetskii. <i>J. Exptl. Theoret. Phys.</i> 10: 8, 8, 9, 1187-4(1930); <i>Chem. Zvest.</i> 1940, 1, 396; <i>U. S. S. R.</i> 34, 7907. A study is reported of the thickness and velocity of propagation of zones of thermal disturbance and the significance of the Grahof number in the treatment of processes of this kind. M. O. Moore</p>			
METALLURGICAL LITERATURE CLASSIFICATION			
FROM OTHER SOURCES		FROM OTHER SOURCES	
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100		1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100	

Ignition of coal and high-speed gasification. D. A. Frank-Kamenetskii. *J. Tech. Phys.* (U. S. S. R.) 9, 1157-61 (1930).—Theoretical. Reactions between gas and solid are considered and the conditions stated for the rate of reaction detd. by the reaction const. and for it detd. by the rate of the gas flow. When the reaction is exothermic and the gas flow rapid the transition from one state to the other takes place suddenly at a definite temp. This explains the results of Grodzovskii and Chukhanov (cf. *C. A. 30, 01637*). J. J. Bikerman

PROCESSING AND PROPERTIES INDEX

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Calculation of thermal explosion limits. D. A. Frank-Kamenetskii. *Acta Physicochim. U. R. S. S.* 10, 365-70 (1936) (in English).—A thermal explosion theory leading to the equation $\Delta T = -(Q/A)_{ss} - h/RT_{ss}(E/RT_{ss})(T - T_s)$ is developed. The ignition temp. explosion limits so calcd. agree with those experimentally found for asomethane by Rice (cf. C. A. 22, 1869); MeNO₂, by Applin; N₂O, by

L. Kovich and Yakovlev (cf. C. A. 32, 5825); and for H₂, by Y. and Shantarovich (cf. C. A. 31, 4191). The explosion limit calcd. for N₂O was subsequently found experimentally. With Et azide, the calcd. values disagree with the exptl. values of Rice and Campbell (C. A. 29, 5273).

P. H. Rathmann

1ST AND 2ND ORDERS																										3RD AND 4TH ORDERS																									
PROCESSES AND PROPERTIES INDEX																																																			
CA																										24																									
<p>Temperature distribution in reaction vessel, and stationary theory of thermal explosion. D. A. Frank-Kamenetskii. <i>J. Phys. Chem.</i> (U. S. S. R.) 13, 734-55 (1936); cf. <i>C. A.</i> 33, 6049^g.—By math. analysis of the mechanism of heat loss in a gas mixt. it has been possible to devise a method of calcg. the inflammation limit from the kinetics and heat effect of the reaction, the thermal cond. of the gas mixt., and the dimensions of the vessel. The results agree generally with existing expul. data. H. C. P. A.</p>																																																			
<p>158-55A METALLURGICAL LITERATURE CLASSIFICATION</p>																																																			
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LIST AND INDEX PROPERTIES																										LIST AND INDEX PROPERTIES																									
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<p>APC</p> <p style="text-align: right;">A-1</p> <p>Diffusion theory of heterogeneous reactions. D. A. FRANK-KAMENETSKII (J. Phys. Chem. Russ., 1939, 13, 756-758).—The kinetics of heterogeneous reactions are worked out for the case where the rate of reaction at the interface and the rate of diffusion of reactants to the interface are comparable in magnitude. R. C.</p>																																																			
<p>ASB-52A METALLURGICAL LITERATURE CLASSIFICATION</p>																																																			
<p>ROOM 510-02100</p>																																																			
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<p>Carbon dioxide reduction. D. A. Frank-Kamenetskii. <i>Compt. rend. acad. sci. U. R. S. S.</i> 23, 663-6 (1936). - The kinetics of the reduction of CO_2 by activated ash-free sugar C were measured under static conditions by a method similar to that of Brown and Travers (<i>C. A.</i> 26, 3427) at 600° and at pressures of 50-200 mm. Hg. The course of the reaction was followed by measuring the thermal cond. of the gas mist. With a surface-cleaned C a measurable reaction takes place at not less than 600°, and between 600° and 750° the reaction is $\text{CO}_2 + \text{C} \rightarrow \text{CO} + (\text{CO})$ (I),</p>	
<p>where (CO) denotes a surface oxide of C which can be regarded as chemisorbed CO. In this temp. range the total pressure, after an initial drop, remains approx. const. From 750° to 900° a steady increase in pressure is found which in the initial stages is not equiv. to the CO formed. No CO is formed between 600° and 680°, and the only sign of action is an initial fall in pressure owing to activated adsorption of CO_2. The formation of an activated complex (CO_2) is probably responsible also for the initial fall in pressure between 600° and 750°. The phenomena between 750° and 900° are considered as a superposition of I and of (CO) desorption, $(\text{CO}) \rightarrow \text{CO}$. At room temp. only the process of a phys. CO_2 adsorption has been observed, and its velocity is immeasurably high. Two schemes of the reaction mechanism satisfactorily explain the observed phenomena: (1) the direct impact of activated CO_2 mole. on a C surface free from (CO) and (CO), and (2) the theory that the first step of the reaction is the activated CO_2 adsorption followed by the reaction of chemisorbed (CO_2) with a surface free from (CO).</p>	
<p>B. C. P. A.</p>	
<p>Physico-Chem. Lab. Mbr., AS</p>	
<p>ASH-15A METALLURGICAL LITERATURE CLASSIFICATION</p>	

101 AND 102 (REV. 10-1-60)

PROCESSES AND MECHANISMS

BC

Resonance theory of auto-catalysis. D. A. FRANK-KAMENETSKI (Compt. rend. Acad. Sci. U.R.S.S., 1936, 25, 669-670).—A lowering of activation energy through resonance between two canonical structures of the transition state, arising when reaction takes place in a collision of a molecule of product with a mol. in the initial state, is suggested in the case of reactions of the form $A \rightarrow B, \rightarrow B$ where A and B are initial and final states, and B_1 is the transition state. I. J. J.

Inst. of Chem. Physics, Leningrad

ASB-5LA METALLURGICAL LITERATURE CLASSIFICATION

101 AND 102 (REV. 10-1-60)										101 AND 102 (REV. 10-1-60)									
101 AND 102 (REV. 10-1-60)										101 AND 102 (REV. 10-1-60)									
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

FRANK-KAMENETSKIY, D. A.

"A Thermodynamic Analogy of the Uncertainty Principle," Zhur. Eksper. i Teoret.
10, No. 6, 1940. pp. 700-702

Inst. Chemical Physics, Leningrad.

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Laminar combustion in carbon pores. D. A. Frank-Kamenetskii. *J. Tech. Phys.* (U. S. S. R.) 10, 1207-9 (1940); cf. *C. A.* 33, 4765^o.—Theoretical computations of kinetic and diffusion phenomena are based on the experimental results of Predvoditelev and Tsukhanova (preceding

post.). The coeff. of O diffusion at 1000-1100°, is estd. to be 3.5 cm.²/sec. Roksalana Gamow

1ST AND 2ND EDITIONS		140 AND 170 000121	
<p>PROCESSES AND PROPERTIES INDEX</p> <p>Diffusion and kinetics of heterogeneous reactions. D. A. Frank-Kamenetskii. <i>Acta Physicochim. U. R. S. S. S.</i> 12: 9-12 (1940) (in English).—Theoretical-math. The case in which the rates of the kinetic reaction and the diffusion processes are nearly equal is considered. Diffusion theory of photographic development. D. A. Frank-Kamenetskii. <i>Ibid.</i> 13-24 (in English).—Theoretical. It is assumed that the rate-controlling reaction in development is the electrochem. oxidation of the developer on the silver surface. By assuming that its velocity is governed by the diffusion of the developer (R_{ad}) and its oxidation products (Ox^*), the equation $W = AD_1(\sigma - 1)/(1/Ox^*) + (D_1/D_2)(1/R_{ad})\sigma$ is obtained, where $\sigma = (F/RT)\Delta\phi$, $\Delta\phi = (RT/F)\ln(R_{ad}[Ag^+]/KOx)$, D = coeff. of diffusion, and A is a const. depending on the developer, rate of stirring and geometrical conditions (dimensions). F. H. Rathmann</p>			
<p>Physico-Chem. Lab., AS USSR, Leningrad</p>			
<p>ASR-51A METALLURGICAL LITERATURE CLASSIFICATION</p>			
FROM SYNONYM		FROM BROWSE	
100000 01		001111 001 001 101	
100000 01		001111 001 001 101	

FRANK-KAMENETSKIY, D. A.

"Diffusion Theory of Photographic Development," Acta Physicochemica URSS,
Vol. 12, pp 13-24, 1940

11 AND 12P 100111		PROCESSING AND POSTPROCESSING																																																																																																					
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<p>Carbon dioxide reduction. A. D. Somovskaya and D. A. Frank-Kamenetskii. <i>Acta Physicochim.</i> U.R.S.S. 12, 870-88(1940)(in English).—The kinetics of the reaction $\text{CO}_2 + \text{C} = 2\text{CO}$ were investigated by a static method over a temp. range of 800-900° at pressures of 80-200 mm. Hg. According to the reaction scheme adopted, the primary step is $\text{CO}_2 + \text{C} = \text{CO} + [\text{CO}]$ (where $[\text{CO}]$ denotes chemisorbed CO) occurring on the free C surface and re-equilibrating activation in the gas phase. The energy of activation is about 37 kg. cal., independent of surface conditions. The reaction is inhibited by the $[\text{CO}]$ accumulated on the surface. The crit. increment of the reaction $[\text{CO}] = \text{CO}$ depends on the surface conditions and on the presence of mineral admixts.; it decreases upon the addn. of Fe. At low temps. activated CO_2 adsorption inhibits the reduction of CO_2. The stationary reaction rate of the CO_2 reduction is given by the formula:</p> $W = \frac{0.6 \times 10^{-2} C \exp \left[\frac{(E_1/2430) - (20000 + E_2)/RT}{1} \right]}{0.8 (C/\gamma) \exp \left[\frac{(E_1/2430) - (20000 + E_2)/RT}{1} \right] + 8.0 \times 10^{-2} \exp \left[\frac{(E_1/2430) - (E_2/RT)}{1} \right]}$ <p>In this equation W is the reaction rate in moles per cm.² per sec., C is the concn. of CO_2 in the gas phase in moles per cc., γ is the adsorption capacity of C in moles of $[\text{CO}]$ per sq. cm., and E_1 is the desorption energy of $[\text{CO}]$ in cal. per mole.</p> <p>H. C. Thomas</p>																																																																																																							
ASB-51A METALLURGICAL LITERATURE CLASSIFICATION																																																																																																							
<table border="1"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td><td>31</td><td>32</td><td>33</td><td>34</td><td>35</td><td>36</td><td>37</td><td>38</td><td>39</td><td>40</td><td>41</td><td>42</td><td>43</td><td>44</td><td>45</td><td>46</td><td>47</td><td>48</td><td>49</td><td>50</td><td>51</td><td>52</td><td>53</td><td>54</td><td>55</td><td>56</td><td>57</td><td>58</td><td>59</td><td>60</td><td>61</td><td>62</td><td>63</td><td>64</td><td>65</td><td>66</td><td>67</td><td>68</td><td>69</td><td>70</td><td>71</td><td>72</td><td>73</td><td>74</td><td>75</td><td>76</td><td>77</td><td>78</td><td>79</td><td>80</td><td>81</td><td>82</td><td>83</td><td>84</td><td>85</td><td>86</td><td>87</td><td>88</td><td>89</td><td>90</td><td>91</td><td>92</td><td>93</td><td>94</td><td>95</td><td>96</td><td>97</td><td>98</td><td>99</td><td>100</td> </tr> </table>				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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A-1

Thermal explosion of the $\text{H}_2 + \text{O}_2$ mixture. D. Frank-Kamenetskii (*Acta Physicochim.* U.R.S.S., 1940, 18, 730-737).—The location of the third explosion limit of the $\text{H}_2 + \text{O}_2$ mixture, reported by Cohenberg and Sommers (A.I., 1939, I, 326), was predicted by the author on theoretical grounds (cf. A.I., 1940, I, 336). The approx. agreement between theory and experiment indicates the thermal nature of this third limit. P. L. H.

AIR-ILA METALLURGICAL LITERATURE CLASSIFICATION

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A-1

BC

Mechanism of two-stage ignition. D. A. Frank-Kamenetski
(*J. Phys. Chem. Russ.*, 1950, 16, 20-24).—Reaction the rate
of which increases to ignition, decreases, and then rises to a
second ignition (cf. Belov and Neumann, A., 1938, 1, 236)
can take place if $dx/dt = k_1 x^2 - k_2 xy$ and $dy/dt = k_3 xy -$
 $k_4 y^2$, x , y , and z being the concns. respectively of the com-
bustible substance A , of an intermediate product X formed
from A , and of another intermediate product Y originating
from X . In combustion of hydrocarbons the product X is
probably a per-acid, and Y an aldehyde. J. J. B.

A-1

BC

Reduction of carbon dioxide by carbon. A. F. Semetichkova and D. A. Frank-Kamenetski (*J. Phys. Chem. Russ.*, 1940, 14, 291—304).—When coke or sugar C is heated with CO_2 at 50—300 mm. Hg the gas pressure, after a small fall due to an adsorption of CO_2 , remains const. at 600° since half of the CO formed is adsorbed by C; at 770° the pressure increases slowly, and at 800° rapidly since 3 CO are liberated for 1 CO_2 consumed. The reaction $\text{CO}_2 + \text{C} = \text{CO} + \text{adsorbed CO}$ has an activation energy of 27 kg.-cal. for coke, C, or $\text{C} + \text{Al}_2\text{O}_3$ or $+\text{Fe}_2\text{O}_3$. For the activation energy of the desorption of CO vials of 23—69 kg.-cal. are obtained. J. J. R.

1ST AND 2ND ORDERS										3RD AND 4TH ORDERS									
CONDITIONS FOR THE APPLICABILITY OF EISENSTEIN'S METHOD in chemical kinetics. D. A. Frank-Kamenetskii, J. Phys. Chem. (U. S. S. R.) 16, 555-560 (1940).—Math. theoret. F.-K. shows that of the 3 inequalities to which the method leads when applied to the most general case, only that demanding a relatively short life of the inter- mediate products is general in the majority of cases. F. H. Rathmann																			
438.314 METALLURGICAL LITERATURE CLASSIFICATION																			
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1ST AND 2ND ORDERS										3RD AND 4TH ORDERS									

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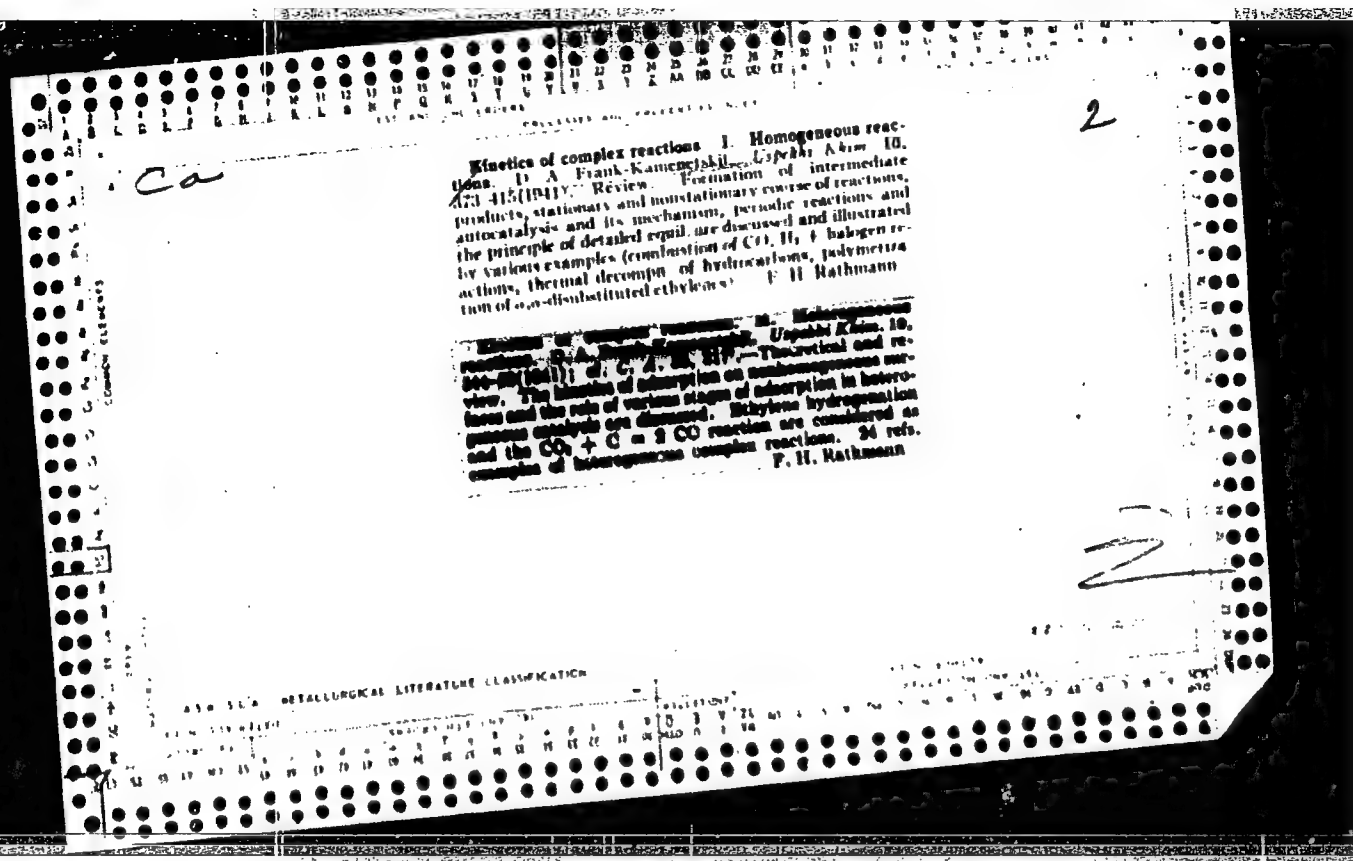
B-2-3

Diffusion theory of photographic development. D. A. Frank-Kamenetskii (*Izv. Akad. Nauk SSSR, 1940, 18, 13-15*).—In the theory of photographic development posed, the essential process is the electrochemical oxidation of the developer at the Ag surface, and its rate is determined by the rate of diffusion of the developer to the surface and of the products away from it. This leads to qual. agreement with observation. F. J. G.

Inst. of Chem. Physics, Leningrad.

ASD-11A METALLURGICAL LITERATURE CLASSIFICATION

SCIENCE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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Ignition and extinction of solid surfaces. D. A. Frank-Kamenetski
(*Compt. rend. Acad. Sci. U.R.S.S.*, 1941, 80, 734-737).—An
equation for the steady surface temp. during surface reaction is
derived, and the conditions of the surroundings for this temp. to be
unique are determined. The implications of this with respect to
the transition of a reaction from small to large temp. intervals above
the surroundings are considered. H. V. S.-R.

CA		2	
<p>The thermal regime of heterogeneous exothermal reactions. D. A. Frank-Kamenetskii. <i>Doklady Akad. Nauk U. R. S. R., Physics-Chem. and Math. Sci. Sect.</i> 1943, No. 1-3, 47-51 (in Russian, 53, in English, 53-5).— Two thermal regimes of a reacting surface are possible in the course of strongly exothermal heterogeneous reactions of a high temp. comb. The upper regime corresponds to extended high heating and to a diffusion region, and the lower regime to low heating and to the kinetic region. The transition between these 2 regimes takes place suddenly at the crit. conditions of ignition and heat extinction. Heating of the surface at the upper temp. regime is detd. by the conditions of diffusion and heat transfer and does not depend on the kinetics of the reaction, as may be demonstrated experimentally. In the catalytic oxidation of H₂, thermocatalysis plays an important part. On the other hand, the crit. conditions of ignition and extinction depend on the kinetics of the reaction. The energy of activation can be calcd. easily from the magnitude of the interval between these 2 points—ignition and extinction. Exptl. data are presented on the catalytic oxidation of H₂ and NH₃ on Pt. These confirm the considerations presented and point to a possible application in tech. problems.</p> <p>J. S. Jaffe</p>			
<p>ASAC-LLA METALLURGICAL LITERATURE CLASSIFICATION</p>			
<p>SEARCHED INDEXED</p>		<p>ABSTRACTED</p>	
<p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100</p>		<p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100</p>	

101 AND 102 CODES		PROCESSING AND PROPERTIES INDEX		103 AND 104 CODES																																																																																											
105 AND 106 CODES		107 AND 108 CODES		109 AND 110 CODES																																																																																											
<p>Activation in heterogeneous reactions. D. A. Frank-Kamenetskii. <i>Doklady Akad. Nauk U. R. S. R., Physico-Chem. and Math. Sci. Sect.</i> 1942, No. 1-3, 55-59 (in Russian, 59, in English, 60).—The questions of the participation of the surface energy of a solid in the process of activation and the current theories on the subject are considered. If the reaction starts at the moment when the gas meets the solid surface the activation takes place in the gas phase. The energy of activation does not depend in this case on the specific properties of the surface, or on its energy and kinetic characteristics. On the other hand, if adsorbed molecules participate in the reaction the activation takes place on the surface. In this case the surface energy may participate in the activation even though the mechanism is not clear, and the kinetics of the reaction depend on the nonuniformity of the surface. Investigations of the relation between the energy of activation and the preexponential multiple involved in the alteration of surface properties, particularly with the introduction of different admixtures, offer the possibility of determining the fundamental kinetic characteristics of a heterogeneous surface—the function of the distribution of the activation energies. The theories and discussion presented are illustrated with a concrete example of the reaction of CO₂ with C.</p> <p style="text-align: right;">J. S. Joffe</p>																																																																																															
ASB-55 A METALLURGICAL LITERATURE CLASSIFICATION																																																																																															
<table border="1"> <tr> <td>111</td> <td>112</td> <td>113</td> <td>114</td> <td>115</td> <td>116</td> <td>117</td> <td>118</td> <td>119</td> <td>120</td> <td>121</td> <td>122</td> <td>123</td> <td>124</td> <td>125</td> <td>126</td> <td>127</td> <td>128</td> <td>129</td> <td>130</td> <td>131</td> <td>132</td> <td>133</td> <td>134</td> <td>135</td> <td>136</td> <td>137</td> <td>138</td> <td>139</td> <td>140</td> <td>141</td> <td>142</td> <td>143</td> <td>144</td> <td>145</td> <td>146</td> <td>147</td> <td>148</td> <td>149</td> <td>150</td> <td>151</td> <td>152</td> <td>153</td> <td>154</td> <td>155</td> <td>156</td> <td>157</td> <td>158</td> <td>159</td> <td>160</td> <td>161</td> <td>162</td> <td>163</td> <td>164</td> <td>165</td> <td>166</td> <td>167</td> <td>168</td> <td>169</td> <td>170</td> <td>171</td> <td>172</td> <td>173</td> <td>174</td> <td>175</td> <td>176</td> <td>177</td> <td>178</td> <td>179</td> <td>180</td> <td>181</td> <td>182</td> <td>183</td> <td>184</td> <td>185</td> <td>186</td> <td>187</td> <td>188</td> <td>189</td> <td>190</td> <td>191</td> <td>192</td> <td>193</td> <td>194</td> <td>195</td> <td>196</td> <td>197</td> <td>198</td> <td>199</td> <td>200</td> </tr> </table>						111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
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B. 16.

No. 4

Periodic reactions and the mechanism of hydrocarbon oxidation.
J. G. Gervart and D. A. Frank/Kamenskii (Bull. Acad. Sci.
U.R.S.S., *Cl. Sci. Chem.*, 1943, 210-230).—The passage of a
mixture of higher hydrocarbons and air (or O_2) through a turbulent
reaction chamber causes, within a suitable temp. range, regular
pulsations of cold flame. The frequency of these is almost inde-
pendent of the type of fuel or of its concn. but increases sharply with
a rise in temp. or of $[O_2]$. Experiments were carried out with
straight-run, polymer, and by-product (from synthetic rubber
manufacture) gasolines. The optimum temp. for the occurrence of
pulsations was 300° , with a range of $301-445^\circ$, this being widest for
fuels of high olefine content. The duration of the pulsations is
2-6-20 sec., being the greater in the larger of the two reaction
vessels used. The excess air coeff. was 0.08-0.23. The data
presented, particularly the independence of the pulsation frequency
of the rate of fuel feed, confirm the kinetic nature of the phenomenon.
V. B.

Institute of Chemical Physics

FRANK-KAMENETSKIY, D. A.

"Theory of Vapor Condensation in the Presence of Noncondensing Gases,"
Zhur. Tekh. Fiz., 12, No.7, 1942, pp. 327-366.

Inst. Chem. Phys., AS USSR

BC

PROCESSED AND FORWARDED UNDER

Calculation of isomerization equilibrium of ethyl and methylacetylene. D. A. Frank-Kamenetski and V. G. Markovitch (*J. Gen. Chem. Russ.*, 1943, 12, 816-830). Quant. calculation of isomerization equilibrium with hydrocarbons, normally very difficult on account of large probable errors in the initial data, is rendered possible for C_2H_2 , (I) and $CH_3C\equiv CH$ (II) by the very accurate experimental data of Kistiakowsky (A., 1936, 291: 1939, 1, 473) on the heats of hydrogenation of the isomers, by the known Hamao and infra-red spectra which give vibration frequencies of the mol. (Lianet and Avery, A., 1939, 1, 4; Crawford, *ibid.*, 1939, by data of mol. structure and internat. distances (e.g., Pauling, A., 1937, 1, 448), giving mol. moments of inertia, and by the fact that the absence of internal rotation simplifies calculations. It is shown that the state sum method and the standard entropy method yield the same results for equilibrium concns. and concns. at corresponding temp. The const. (state sum method) is 15.71 (354° K.), 9.06 (473° K.), 5.52 (673° K.), 4.74 (773° K.), or 4.21 (873° K.) and the % of (I) in the equilibrium mixture is 9.96, 9.04, 15.24, 17.43, or 19.90 respectively. The heat effect of isomerization has a min. at ~473° K. The calc. concns. of (II) are > the only analytical val. recorded (Slobodin, A., 1937, 11, 174) but in that case equilibrium was either not attained or it was complicated by the presence of extraneous gases produced possibly by polymerization and decomp. of the polymers. In the standard entropy method the total S ($S_{\text{trans}} + S_{\text{rot}} + S_{\text{vib}}$) is consistently ~2.10 g.-cal. per degree per mol. > Lianet and Avery's results (*ibid.*); as the results for S_{vib} agree exactly it is supposed that the earlier workers took 12 and not 4 as the symmetry no. for (I), which would make their results low by $R \log 3$ (or 2.10). G. S. S.

ASD-5.6 METALLURGICAL LITERATURE CLASSIFICATION

FRANK-KAMENETSKIY, D. K.

"Mathematical Theory of Thermal Explosions," Acta Physicochemica URSS, Vol. 16,
pp 357-361, 1942

Isomerization equilibrium of α -methylstyrene. D. A. Frank-Kamenetski and V. G. Markovitch (*Acta Physicochim. U.S.S.R.*, 1948, 19, 808-813).—The value of the equilibrium constant from spectroscopic and heat of hydrogenation data, are 15.5,

9.9, 8.5, 4.7, and 4.2 at 25°, 300°, 400°, 500°, and 600° respectively. With rise of temp. the proportion of $C(CH_3)_2$ in the equilibrium mixture rises from 6.6% to 10.2%. Revised value for the entropy of $C(CH_3)_2$ at these temp. are 60.52, 66.87, 73.44, 76.78, and 79.91 g.-cal. per degree per mol. respectively. C. R. H.

13c

Feasibility of auto-oscillations in a homogeneous chemical system involving a quadratic auto-catalysis. D. A. Frank-Kamenetski and E. Sainikov *J. Phys. Chem. Russ.*, 1948, 17, 79-86. Some

71
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Conditions under which periodic catalytic reactions can occur are discussed. J. J. B.

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AND-SEA METALLURGICAL LITERATURE CLASSIFICATION

AS 200
H-6 - ...
...
Kinetics and mechanism of photographic development. D. A. Frank-Kamenetski (*Acta Physicochim. U.R.S.S.*, 1943, 18, 91-92).—The exponential increase of velocity of linear growth of an individual Ag nucleus with time (Rabinovitch, A., 1943, 1, 93) can be explained on the assumption that rate of development is determined by the electrochemical oxidation of the developer proceeding on the whole surface of the Ag nucleus, the deposition of Ag taking place, however, only on its perimeter. The theory of Anastasevitch (*ibid.*, 95) is discussed.

AS USSR, Inst. of Chem-Phy.

AI-8-1943

SV abs

* Thermal reactions of acetylene. I. Kinetics and mechanism of thermal polymerization of acetylene and its reaction with nitric oxide. D. A. Frank-Kamenetski (*Acta Physicochim. U.R.S.S.*, 1943, 18, 148-156).—The thermal polymerization of C_2H_2 at 400–700° and 80–760 mm. occurs in three stages: (i) an induction period without change of pressure, (ii) a homogeneous bimol. dimerization, (iii) a heterogeneous reaction with formation of high polymers, H_2 and C. NO prolongs (i), and polymerization is delayed until the NO is consumed. The temp.-dependence of (i) and (ii) corresponds with the same activation energy. The kinetics agree with a scheme involving primary combination of $2C_2H_2$ to give an unstable C_4H_4 , which can decompose into $2C_2H_2$ or two radicals, the latter at a slow rate. L. J. J.

Inst. of Chem-Phy.

COMMON ELEMENTS		PROCESS AND PROPERTIES INDEX	
<p>11</p> <p>2</p> <p>Thermal reactions of C_2H_2. 1. Kinetics and the mechanism of the thermal polymerization of C_2H_2 and of its reaction with NO. D. A. Frank-Kamenetskii. <i>J. Phys. Chem. (U.S.S.R.)</i> 18, 330-34(1944).--Exptl. data show that at pressures of 50-100 mm. and temps. of 400-700°, the course and rate of the reaction are essentially the same in glass, quartz, and "durabak" vessels. As little as 1% of NO completely inhibits the reaction, and the reaction does not again proceed until the NO has been consumed by reaction with C_2H_2 to form an addition compd. This period of inhibition is directly proportional to the partial pressure of NO added, and inversely proportional to the square of the total pressure. F. H. Rathmann</p>		<p>100 AND 10M INDEX</p>	
<p>ASD-15A METALLURGICAL LITERATURE CLASSIFICATION</p>		<p>100M INDEX</p>	
<p>100M INDEX</p>		<p>100M INDEX</p>	

Ab. Abs.

II-8, Reaction

Ignition of carbon and kinetics of its reaction with oxygen.
 A. Klibanova and D. Frank-Kamenetzki (Acta Physicochim. U.R.S.S., 1943, 18, 387-405). - The kinetics of the reaction between C and O₂ at ordinary pressure and at high temp. have been measured by a method based on the determination of the temp. which a C filament must attain before it ignites in a stream of air or other O₂-containing gas. The abs. reaction velocity at ~1200°K. is ~ 10⁻⁴ mol. per c.c. per sec., a val. of the same order as is obtained by other methods. The present data show a temp.-dependence which suggests an activation energy > energies previously reported. The present val. is 75-135 kg.-cal. per mol., corresponding with a reaction order 0.4—0.8, and definitely < 1.
 C.R.H.

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